

Docket No.: 12810-00346-US1
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Valerie Andre et al.

Application No.: 10/594,735

Confirmation No.: 1588

Filed: September 29, 2006

Art Unit: 1611

For: SURFACE-MODIFIED METAL OXIDES
METHODS FOR PRODUCTION AND USE
THEREOF IN COSMETIC PREPARATIONS

Examiner: B. S. Frazier

DECLARATION UNDER 37 C.F.R. 81.131

MS Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Madam:

I, Valérie André, Dr. rer. nat., a citizen of France and residing at Brunckstraße 19, 67063 Ludwigshafen, Federal Republic of Germany, declare as follows:

I am a fully trained chemist, having studied chemistry in the period 1982 – 1985 at the University of Pierre et Marie Curie, Paris, France.

I received my PhD degree from the University of Pierre et Marie Curie in 1990. I joined BASF SE (former BASF Aktiengesellschaft) of 67056 Ludwigshafen, Federal Republic of Germany, in 1990. Since joining BASF SE I have been working mainly in the fields of polymer chemistry and physics and UV filters.

I am one of the inventors of the invention disclosed and claimed in US Patent Application Serial No. 10/594,735 and am therefore familiar with the field to which said application relates.

I studied the Office Action mailed March 25th, 2009, wherein the Examiner rejected our claims 1 to 20 as being unpatentable over Tanner et al. in view of Meguro et al. and Mazo et al. and as being unpatentable over Kropf et al. in view of Mazo et al.

Our invention is making available nanoparticulate metal oxides, which permit the production of stable nanoparticulate dispersions in water or polar organic solvents and also in cosmetic oils. Irreversible aggregation of the particles is to be avoided so that an additional, complex grinding process is not necessary. Such metal oxide particles should have an average primary particle diameter of from 10 to 200 nm.

The experiments as described below clearly demonstrate superior results achieved by the invention!

Experiment:

Influence of the polyaspartic acid's M_w of on the size of the zinc oxide particles

The ZnO nanocrystals were produced by mixing 1000 ml Zn-salts as a precharge with 1000 ml NaOH-solutions. The polyaspartic acids were dissolved in NaOH.

Reagents:

- VE Water I 542 S (deionized water)
- zinc chloride, p.a. (Merck)
- NaOH, analytical grade (Merck)
- polyaspartic acid of different molecular weight, concentration 4 g/L

equipment:

- double wall beaker
- temperature RT, 40°C
- reaction time 15 min, 2h
- paddle stirrer 200 rpm

reconditioning:

- cross flow filtration (100, 300 Dalton membrane)

- followed by centrifugation (15 000 rpm, 30 min)
- drying: 80°C, ca. 12h (compartment dryer)
- pounding the powder in a mortar

The precipitation reactions were performed by adding NaOH into the beaker containing the Zn salts (precharge), which was stirred by means of a paddle stirrer. Transmission, pH and temperature were recorded during the precipitation reactions. The final products were filtrated and concentrated using cross-flow filtration and finally dried overnight at ca. 80°C.

SEM (scanning electron microscopy)

A few milligrams of the material were deposited on an aluminum support. By sputtering a thin gold layer (ca. 5-6 nm) onto the sample it was rendered conducting. Afterwards the sample was transferred into a Hitachi S 4000 scanning electron microscope.

Molecular weight of Polyaspartic acid [g/mole]	Average size of precipitated Zinc Oxide particles [nm]
ca. 2600	ca. 137
ca. 4000	ca. 172
ca. 5800	ca. 170
ca. 25000	ca. 590

The Office Action asserts that we did not correlate the data with any unexpected or advantageous effect. We respectfully disagree. It is well-known in the art, that smaller particle size results in better transparency of dispersions of such particles. It was therefore an objective of this invention to produce small particles, especially in the range of 10 to 200 nm.

It could however not be expected that this goal could be achieved by precipitating zinc oxide in the presence of polyaspartic acid of molecular weight from 1000 to 7000.

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Mazo et al.

Mazo et al. disclose that polyaspartates may be used, among many other applications, as additives for cosmetics and personal care products (col. 1, ll. 16-17). Further Mazo et al. disclose that "There is an ongoing need therefore, for a convenient method of catalytically polymerizing aspartic acid to polysuccinimide in high yield, purity and of desired high molecular weight." (col 1, ll. 39-42).

The overlapping area between Mazo's 3000 to 40000 range and this invention's 1000 to 7000 range is the range of from 3000 to 7000. Only a minor portion (9 out of 39 examples) of Mazo's polysuccinimids are converted into polyaspartates with a Mw in the range of 3000 to 7000. There is no teaching in Mazo et al. that exactly such polyaspartates of a Mw in the range of from 3000 to 7000 are capable of producing the desired Zinc oxide particles whereas polyaspartates of higher molecular weights are not suitable (see the experiment above). Further, I could find no basis for the examiner's statement, that the utilization of polyaspartic acid of higher molecular weight would result in particles of increased particle size.

Meguro et al.

To my understanding, Meguro et al. disclose in col. 2, ll. 3-20 a large number of possible surface modifiers, and, amongst many others, polyaspartates. However, Meguro's teaching, which is relevant for its consideration for rendering our invention obvious, is the utilization of acetylated basic amino acids (col. 7, ll. 19-22) as surface modifiers. Therefore, the skilled person studying Meguro et al. is taught to modify the pigments' surface with N-acetylated basic amino acids but not with *non-acetylated polyamino acids*.

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I further declare that all statements made herein of my own knowledge are true and that statements made on information or belief are believed to be true; and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

24-06-2009

Date

Valérie André

Dr. Valérie André